

1 A device as recited in claim 1, wherein:

2 each phase line in the electrical system supplies power to at least one nonlinear load;

3 said device includes a second electrical circuit, each of said first and said second
4 electrical circuits being connected along a separate phase line therein in said electrical
5 system and in series with at least one nonlinear load whose power is supplied by said
6 separate phase line, said first and said second electrical circuits substantially eliminate a
7 harmonic current in each of said separate phase lines drawn by said nonlinear loads;

8 said second electrical circuit comprises a fourth passive electrical component, a fifth
9 passive electrical component connected in parallel to said fourth passive electrical
10 component, and a sixth passive electrical component connected in parallel to said fourth and
11 said fifth passive electrical components.

12 wherein each of said first and said second electrical circuits is tuned to a third
13 harmonic frequency of the AC source.

REMARKS

Initially, applicant sincerely appreciates the telephonic interview applicant's representative had with the Examiner. The interview included discussions pertaining to the objections and rejections raised in the outstanding Office Action. As a result of the interview, applicant amends the claims to more closely follow the Examiner's requirements.

Upon entry of the present amendment, the claims in the application are claims 1-15 and 17-21, which is the same number of claims previously paid for (three independent claims and a total of 20 claims). Accordingly, no additional claim fee is believed to be due.

The specification is objected to under 35 USC §112, first paragraph, for failing to provide an enabling disclosure, and claims 17-19 stand rejected under 35 USC §112, first paragraph, similarly. Specifically, the Examiner alleges that a current limiting or clamping circuit, a sensor and a circuit for deactivating the current clamping circuit are not clearly disclosed in the specification. In response thereto, applicant respectfully submits that persons of ordinary skill in the art of electrical system design would be able to make the

invention claimed in claims 17-19 and in particular a current limiting circuit, current level detecting circuit and a switch for deactivating circuits without undue experimentation based upon present circuit design techniques. Applicant respectfully submits that applicant is not claiming a current clamping circuit, a current level detecting circuit or a circuit deactivating circuit in isolation, but rather is claiming the use of such circuits in a unique and nonobvious way as specified in claims 17-19. Significantly, the Examiner has even admitted to such circuits being in existence by taking official notice to that effect. Applicant submits herewith U.S. Patent 4,541,029 as proof of applicant's position. As a result, the objection to the specification and the rejection to claims 17-19 are believed to be overcome.

Claims 5, 6, and 12-19 stand rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the present invention. In response thereto, applicant submits the following.

Claims 1, 5 and 6 have been amended to more clearly point out the subject matter of applicant's invention. Specifically, claim 1 defines a device for substantially eliminating neutral currents generated by nonlinear loads connected to at least one phase line in a multiple phase electrical power system, comprising a parallel combination of three passive electrical components (the first electrical circuit) connected along a phase line therein, in series with at least one of the nonlinear loads and tuned to a harmonic of the AC source so as to substantially eliminate a harmonic current drawn by the at least one nonlinear loads connected to the first electrical circuit.

Further, claims 5 and 6 further define the invention by claiming second and third electrical circuits (each comprising the parallel combination of passive electrical components), with each of the first, second and third electrical circuits being connected along a separate phase line in series with at least one nonlinear load whose power is supplied by that separate phase line, the electrical circuits substantially eliminating a harmonic current drawn by the nonlinear loads in each of the phase lines.

Applicant respectfully submits that amended claims 5 and 6 do in fact further limit the invention from which each depends because claims 1 and 2 now define the first electrical circuit (parallel combination of three passive components) being connected to a phase line;

and whereas claims 5 and 6 now include second and third electrical circuits, each of which is connected along a separate phase line for reducing harmonic currents in the phase lines, thereby reducing neutral currents. Applicant respectfully submits that the language in claims 5 and 6 of each of the electrical circuits (the parallel combination of three passive electrical components) being tuned to an identical harmonic frequency (claim 5) and to a third harmonic frequency (claim 6) are different from only the first electrical circuit being tuned to a harmonic (claim 1) or to a third harmonic (claim 2), thus further limiting claims 1 and 2, respectively. As a result, applicant respectfully submits that the rejection to claims 5 and 6 under 35 USC §112, second paragraph, is now believed to be overcome.

Concerning claims 12-15 and 19, applicant respectfully submits that the claim limitations therein do in fact strongly relate to the device claimed in amended claim 11. Claim 11 stands amended to include a means for connecting the device to a nonlinear load. Further, amended claims 12-15 and 19 clearly define the nature of the claimed invention in sufficient detail so an ordinary person in the art of electrical system or electric circuit design is capable of making the device without undue experimentation.

For instance, claim 12 now pertains to and further defines the connecting means of amended claim 11 as including an equipment rack panel member for mounting the device in an equipment rack so as to allow a nonlinear load stored in the equipment rack to electrically connect thereto.

Similarly, amended claim 13 further defines the connecting means from claim 11 as having at least one electrical socket for electrically connecting to the nonlinear load, and a bracket member for mounting the device (including the electrical socket) along a wall surface.

Claim 14 further defines the invention by including a monitor saver board. Applicant respectfully submits that the monitor saver board is quite clearly related to a device for "reducing currents in an electrical system which supplies power to a nonlinear load" (claim 11, lines 1-3), through decreasing current drawn by the computer monitor loads during periods of inactivity.

Applicant respectfully submits that no language in claims 12-16 and 19 is in any way vague or indefinite, nor are the claims overly broad relative to the relevant art and to the

subject matter disclosed in the application. As a result, applicant respectfully submits that the rejection of claims 5, 6 and 12-19 under 35 USC §112, second paragraph, has been overcome.

Claim 15 stands rejected under 35 USC §112, second paragraph, as lacking structural cooperation between features claimed in claim 11. In response thereto, applicant amends claim 15 to provide such structural cooperation.

Claim 17 stands rejected under 35 USC §112, second paragraph as being indefinite. In response thereto, applicant amends claim 17 to define a current control means (comprised of a current clamping circuit, a current detecting circuit and an electric switch) being connected in series with the parallel connection of the first, second and third passive electrical components. The resulting circuit (a series combination of a current control means with the parallel combination of the first, second, and third passive components) can in fact be connected in series with a nonlinear load, as shown in FIG. 13 of the application. Applicant respectfully submits that this resulting combination of circuits properly defines a device for "reducing currents in an electrical system" (claim 11, lines 1-3) in that the current control means substantially reduces the effects of large current spikes so as to increase the fanout of the electrical system. As a result, applicant submits that the 35 USC §112, second paragraph, rejection to claim 17 has now been overcome.

Claim 18 has been amended to overcome a rejection under 35 USC §112, second paragraph, for lacking an antecedent basis.

Claims 12-16 and 19 stand rejected under 35 USC §112, fourth paragraph, as allegedly being of improper dependent form for failing to further limit the subject matter of the previous claim. In response thereto, applicant traverses the rejection for the reasons stated hereinabove and the following.

First, claims 12, 13 and 15 pertain to the interface of the device and in particular to the way in which the device is connected into the electrical system and as such are directly related to the device recited in claim 11. In fact, the features defined in the claims, the equipment rack panel member (claim 12), the wall outlet mounting bracket (claim 13) and the utility cart mounting bracket (claim 15), further define substantially complete embodiments of the present invention by further defining the connecting means member

positively recited in claim 11. Quite clearly, contentions by the Examiner that claims 12, 13, and 15 refer to multiple inventions from claim 11 are now believed to be overcome.

Claim 14 depends from claim 11 and further defines the device as including a computer monitor saver board. Applicant respectfully submits that the inclusion of a monitor saver board feature directly relates to a device for "reducing currents in an electrical system" (amended claim 11, lines 2-3) in that the monitor saver board reduces current in the electrical system by reducing the current drawn by the computer monitors therein during periods of inactivity. As a result, the device allows the operation of the electrical system to expand to power more loads (computers) by reducing harmonic currents as well as average current levels. By further defining the connecting means positively recited in claim 11, claim 14 is now in proper dependent form.

Claim 19, which depends from claim 18 which itself depends from claim 17, defines specific features of the current control means of a preferred embodiment of the present invention. Applicant respectfully submits that claims 17-19 are directly related to a device for reducing currents in an electrical system in that the inclusion of the current control means limits the peak current drawn by loads in the electrical system. Further, it is unclear to the applicant how claim 19 alone can be subject to a rejection under 35 USC §112, fourth paragraph when claim 19 only further defines the current limiting characteristics and elements of the invention claimed in claim 18, which itself is not subject to a rejection under 35 USC §112, fourth paragraph.

As a result, applicant respectfully submits that the features claimed in amended claims 12-15 and 19 have everything to do with and directly relate to the device recited in amended claim 11, thereby further limiting the subject matter thereof. Accordingly, the rejection of claims 12-15 and 19 under 35 USC §112, fourth paragraph, is now believed to be overcome.

Claims 1-11 stand rejected under 35 USC §103 as being unpatentable over an alleged acknowledged prior art in view of Stacey and Thanawala. In response thereto, applicant respectfully traverses such rejection and submits the following.

Initially, applicant respectfully submits that no reference cited by the Examiner discloses, teaches or even remotely suggests a device for substantially eliminating neutral

currents in a multiple phase electrical power system, as recited in claims 1-6. As stated in *In re Nomiya*, 184 USPQ 607, 612 (CCPA 1975),

[Where] there is no evidence of record that a person of ordinary skill in the art at the time of [an applicant's] invention would have expected [a problem], . . . it is not proper to conclude that [an invention], which solves this problem . . . would have been obvious to that hypothetical person of ordinary skill in the art.

Here, no reference cited by the Examiner discloses the application of a device which is tuned to a harmonic frequency of an AC power supply in substantially addressing the problem of increased neutral currents. Applicant respectfully submits that the particular application of such a device to achieve substantially reduced neutral currents is markedly distinct from the application of the devices disclosed in Stacey and Thanawala. In the absence of any disclosure of a problem pertaining to neutral currents or of a device for reducing neutral currents in an electrical power system, applicant respectfully submits that the specific device claimed in claims 1-6 are distinct and nonobvious over the Examiner's proposed combinations.

Further, no reference disclosed by the Examiner teaches, discloses or otherwise suggests a device for eliminating harmonic currents generated by a nonlinear load in an electrical system, *consisting* of a parallel combination of a first, second, and third passive electrical component, the parallel combination being connected in series with a nonlinear load and tuned to a harmonic frequency of the AC source, as recited in claim 7; wherein the parallel combination is tuned to a third harmonic of the AC source, as recited in claim 8; and wherein the first passive component is a resistor, the second passive component is a reactor, and the third passive component is a capacitor, as recited in claims 9 and 10. In sharp and distinct contrast, the Examiner relies upon the Stacey reference which discloses a *hybrid* device for a *linear* load primarily comprising *active* component(s) 28 (FIGS. 1 and 5); and the Thanawala reference which discloses various combinations of damping circuits which are connected *in series* a compensating capacitor C and a saturable reactor L, the resulting circuit not only failing to disclose a parallel combination of three passive components but also failing to disclose a device which is connected in series with a load (the

resulting circuit is in fact connected in parallel to other devices in the system).

Applicant respectfully reminds the Examiner that the transitional phrase "consisting of" in a preamble of a claim is a closed limitation, as opposed to the transitional phrase "comprising" in a claim preamble. Clearly, in the absence of any reference or combination thereof which discloses a device consisting solely of a parallel combination of three passive electrical components which is connected in series with a nonlinear load so as to reduce harmonic currents generated thereby, applicant respectfully submits that the invention claimed in claims 7-10 is nonobvious.

Significantly, concerning the Examiner's proposed combinations of teachings, applicant respectfully submits that the combination proposed by the Examiner is improper. First, obviousness cannot be established by combining teachings from relevant art to produce the claimed invention if there is no teaching, suggestion, or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital et al.*, 221 USPQ 929, 933 (Fed. Cir. 1984). Moreover, references are not properly combinable if their intended function is destroyed. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). Here, no teaching, suggestion or incentive exists in Stacey or Thanawala for combining the teachings of each or of combining the Stacey teachings with any alleged prior art. Stacey discloses an active device which actually *generates* a ripple current in order to offset ripple current existing in the electrical system under *all* conditions of input frequency and passive component variations (column 3, lines 60-67; and column 4, lines 63-68). Quite obviously, the Stacey device cannot function in this regard if its active element is replaced with a passive component such as a resistor. Thus no teaching, suggestion nor incentive exists in combining the teachings from Thanawala with the Stacey device or from Stacey with an alleged prior art. On the contrary, a *disincentive* actually exists in combining the teachings of each proposed combination, as the primary purpose of Stacey will be altogether destroyed thereby.

Regarding the Examiner's proposed combination of Stacey with the alleged prior art as well as the proposed combination of Stacey and Thanawala teachings, it is impermissible to extract from a reference

only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.

In re Wesslau, 147 USPQ 391 (CCPA 1965). With respect to the combination of Stacey with the alleged prior art, the Examiner has extracted series connected passive components of Stacey to the exclusion of the active components which are entirely necessary to the full appreciation of what Stacey fairly suggests to an ordinary artisan, i.e., a hybrid device for generating offset ripple currents in an electrical system. As a result, applicant respectfully submits that the proposed combination of Stacey with an alleged prior art is improper.

With regard to the proposed combination of Stacey and Thanawala, applicant respectfully submits that the Examiner has somehow extracted a resistor R, capacitor C_P , and reactor L_D from FIGS. 9, 11, 13 and 15 of Thanawala while completely disregarding the fact that the circuits in the drawings are in fact connected *in series* with compensating capacitor C and with saturable reactor L of the electrical circuit (column 4, lines 34-41) so that the cumulative circuit is *shunted* across a device; that the series combination of C_D and L_D form a *series* resonant circuit (column 4, lines 39-41) as opposed to an alleged parallel combination of C_P and L_D as contended by the Examiner; and that other components are utilized in Thanawala so that the cumulative circuit functions as a damping circuit. Indeed, applicant respectfully submits that the Examiner not only has extracted components from the Thanawala devices while ignoring other components which are vital and necessary to the performance and appreciation of the Thanawala invention, but also modified the interrelationship of the extracted components to such an extent that the extracted components function and interrelate entirely contrary to that disclosed by Thanawala. As a result, applicant respectfully submits that the combination of Thanawala and Stacey as proposed by the Examiner is improper.

Applicant respectfully submits that the Examiner's assertion that it would have been obvious to provide a parallel RLC combination in series along each phase line in order to provide balanced protection is a mere bald assertion without any teaching in support thereof. Significantly, no reference cited by the Examiner discloses or otherwise suggests any device

Stacey
Shunted
Thanawala
only used
to shunt
RLC network

for substantially eliminating neutral currents in a three phase electrical system.

As a result, in an absence of any teaching disclosing or otherwise suggesting a device for reducing neutral currents in an electrical system; when there is no suggestion, teaching or incentive for the proposed combinations; when the proposed combinations completely defeat the purpose of the Stacey reference; when the Examiner has impermissibly extracted portions of the Stacey and Thanawala references to the exclusion of vital portions necessary to fully appreciate what each suggests; and when extracted portions of the Thanawala reference are asserted to perform a function which is contrary to what is taught in Thanawala, applicant respectfully submits that the Examiner has failed to establish prima facie obviousness of the invention claimed in claims 1-11. Accordingly, applicant respectfully requests that the rejection to claims 1-11 under 35 USC §103 be reconsidered and withdrawn.

Claims 12-19 stand rejected under 35 USC §103 as being unpatentable over the alleged acknowledged prior art in view of Stacey and Thanawala as applied to the rejection of claims 11, and further in view of Gilardi. In response thereto, applicant respectfully traverses the rejection based upon the reasons stated hereinabove as applied to the rejection of claims 1-11 under 35 USC §103 and upon the following.

Applicant respectfully submits that the proposed combination fails to disclose or otherwise suggest a device for reducing currents in an electrical system, including a connecting means having an equipment rack panel member with perforations for permitting airflow so that loads stored in the rack may be connected to the device, as recited in amended claim 12. This feature is a significant improvement because the device may be mounted in a conventional equipment rack in place of a cooling panel and connected to nonlinear loads without sacrificing equipment rack space.

In addition, the proposed combination fails to disclose or otherwise suggest a current reducing device including a connecting means having a bracket member for mounting the device along a planar surface so as to replace a conventional wall outlet and to connect to a nonlinear load. Such a device is significant and advantageous in allowing the protection circuitry to be substantially hidden and unobservable from view.

The proposed combination additionally fails to disclose or otherwise suggest a current

reducing device including a connecting means comprising a bracket member for mounting the device to a utility cart, as recited in claim 15. Such a device is significant and advantageous in providing a device which connects to and is used with substantially portable equipment, such as medical equipment transported on a hospital utility cart.

Further, the combination proposed by the Examiner fails to disclose or otherwise suggest a device for reducing currents in an electrical system in which it is connected, including a monitor saver board, as recited in claim 14. The device claimed in claim 14 is distinct and advantageous in that the monitor saver board feature saves energy and thereby allows the electrical system to supply power to an increased number of loads.

Still further, the proposed combination fails to disclose or otherwise suggest a device for reducing currents in an electrical system into which it is connected, including a current controlling means comprising a current limiting circuit, a circuit for detecting a rapid rise in current drawn by the load and a switch for automatically deactivating the current limiting circuit, as recited in amended claim 17; wherein the harmonic current limiter is tuned to a third harmonic, as recited in claim 18; and wherein the current limiting circuit maintains a maximum current level drawn by the loads to between 6 and 8 amps, as recited in claim 19. The devices claimed in claims 17-19 provide a significant improvement by not only substantially eliminating harmonic currents but also reducing peak currents in the electrical system, thereby improving the operation of the electrical system.

With regard to the Examiner taking official notice that current sensing and current limiting is well known to those skilled in the art and that it would have been an obvious modification to the Stacey device to detect and limit a high current, applicant respectfully traverses such assertion and requests that the Examiner provide references in support thereof.

As a result, applicant respectfully submits that the Examiner has failed to establish prima facie obviousness of the invention claimed in claims 12-19. Accordingly, applicant respectfully requests that the rejection of claims 12-19 under 35 USC §103 be reconsidered and withdrawn.

The application is now believed to be in a condition for allowance, and a notice of this effect is earnestly solicited.

Favorable reconsideration is respectfully requested.

Respectfully submitted,

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Dated: September 20, 1995

William F. Esser ✓

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